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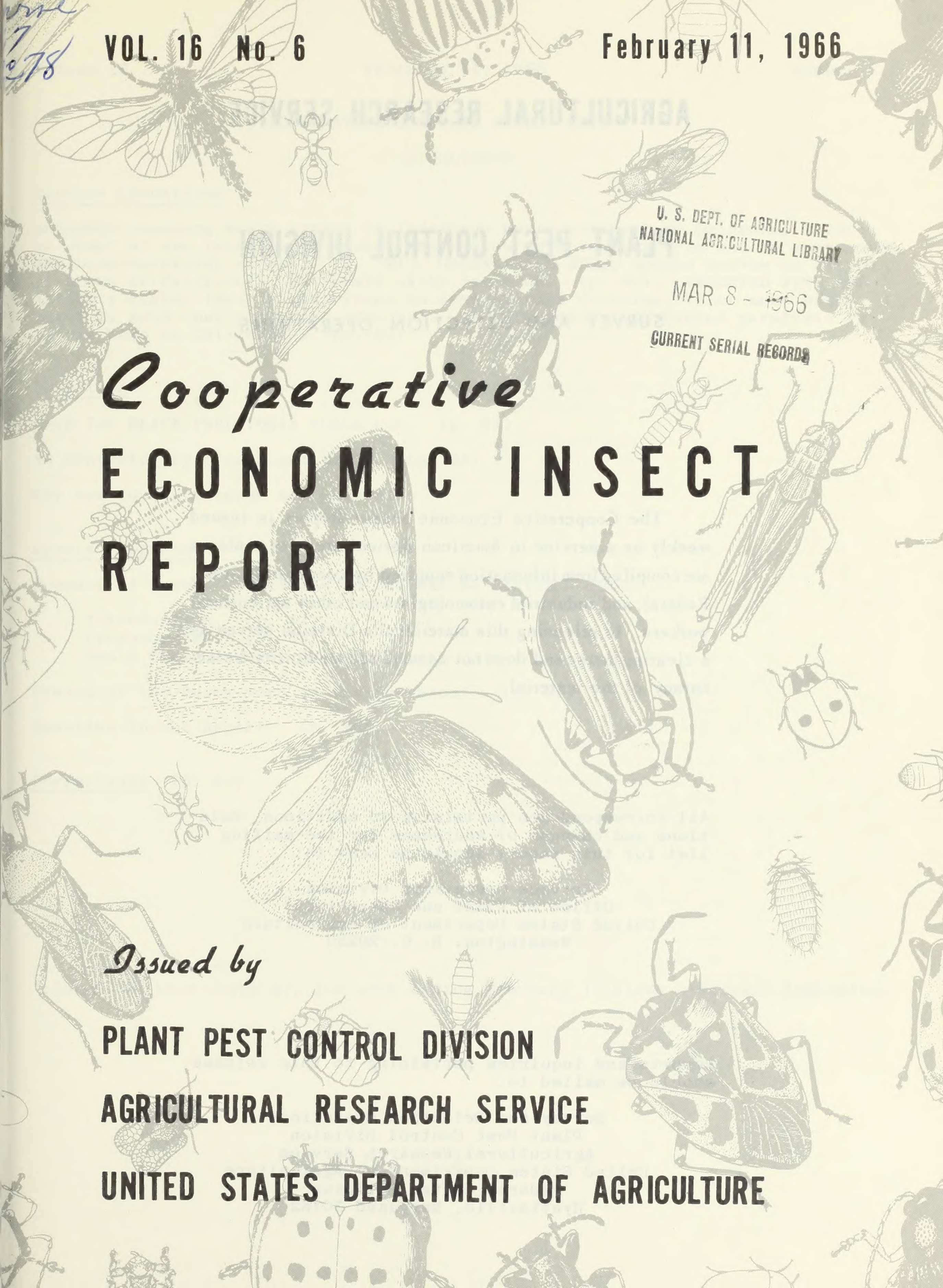

VOL. 16 No. 6 February 11, 1966

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Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 16 February 11, 1966 Number 6

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG damaging small grains in Texas and heavy on wheat in Oklahoma; severe on wheat at one location in Kansas, but below zero temperatures and no snow cover may have deterring effect. (p. 79). GREEN PEACH APHID nymphs medium on leaves of beets in California; extremely early for area. (p. 80). IMPORTED FIRE ANT activity higher than in past years in some Alabama counties; 75 or more hills noted in many open pastures. (p. 83). PACIFIC COAST TICK caused paralysis in cattle herd in California. (p. 82).

Detection

Look for BLACK PARLATORIA SCALE now. (p. 84).

An Ephydrid fly from Sugar Beets. (p. 84).

For new county records see page 84.

Special Reports

Summary of Insect Conditions in the United States - 1965

- Introduction. (p. 87).
- Grasshoppers. (p. 87).
- Small Grain Insects. (p. 91).

Status of the Screw-worm in the Southwest. (p. 85).

Hawaiian Insect Report. (p. 86).

Corrections (p. 84).

Reports in this issue are for week ending February 4 unless otherwise indicated.

WEATHER BUREAU'S 30-DAY OUTLOOK

FEBRUARY

The Weather Bureau's 30-day outlook calls for temperatures to average below seasonal normals over most of the Nation except for near to above normal in the extreme Northeast and in the Pacific Northwest. The most unseasonable cold weather is expected over the southern half of the Nation from the Rockies to the East Coast. Precipitation is expected to exceed normal over most of the Nation except for near to subnormal amounts from the upper and middle Mississippi Valley eastward across the Great Lakes to the Appalachians and also over the Pacific Northwest. North of the South Atlantic and Gulf Coast States an appreciable portion of the precipitation is expected to be in the form of snow.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

WEATHER OF THE WEEK ENDING FEBRUARY 7

HIGHLIGHTS: (1) Cold east of Divide but warmer by week end. (2) Rains California Coast; snow lower Ohio River Valley; light precipitation elsewhere.

TEMPERATURE: The week ending Sunday, February 6, was the second mild week over the Northwest, the third consecutive cold week from the Rocky Mountains to the Mississippi River, and the fourth cold week east of the Mississippi. The entire Nation, except the Florida Peninsula, averaged warmer than the preceding week. The small increases in weekly mean temperatures over the Southwest brought portions of that area to above normal. Temperatures east of the Divide continued below normal in spite of warming which occurred during the latter part of the week and over the weekend. Subzero temperatures occurred earlier in the week from the Rocky Mountains to the Great Lakes; also over the southern Appalachians. Chattanooga, Tennessee, and Caesars Head, South Carolina, registered 10° below zero on Monday, January 31. Subfreezing temperatures occurred over the South, except the lower Rio Grande Valley and southern Florida, along the coast. Northerly winds and clear skies brought subzero readings to upstate New York and portions of New England on Sunday, February 6. Southerly winds produced a sharp warming over the Great Plains and eastward late in the week and over the weekend. On Sunday, February 6, numerous stations in Texas registered maxima in the 70's and temperatures in the 50's and 60's were common in Kansas and Missouri. The sharp warming trend, so noticeable over the Great Plains had a much smaller effect in the Southeast. In fact, much of Idaho, Montana, and portions of the Dakotas were warmer than the Carolinas Sunday night, February 6.

PRECIPITATION: The great blizzard of 1966 ended in the Northeast after leaving record snow falls and record low temperatures at a number of locations. A snow storm developed over the lower Ohio River Valley and left up to a foot of snow from St. Louis, Missouri, to southern Ohio. The mild temperatures late in the week melted much of this snow. A big storm moved into the Pacific Northwest late in the week. It was accompanied by gale-force winds and heavy rains along the coast. Light snow flurries occurred across the northern and central Great Plains and eastward to the Atlantic with sleet and freezing rains at some locations south of the snow area. A few thunderstorms occurred in the Deep South. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (*Schizaphis graminum*) - TEXAS - Damaging small grains in Hopkins and Red River Counties. (Parker). OKLAHOMA - Heavy in wheat in local areas of Mayes County. (Okla. Coop. Sur.). KANSAS - Ranged as high as 200 per linear foot in wheat at agronomy farm in Manhattan, Riley County. Temperature dropped below zero after counts made; no snow cover. (Simpson, Jan. 29).

CORN LEAF APHID (*Rhopalosiphum maidis*) - ARIZONA - Light to medium in early barley in Gila Valley, Yuma County, and in western Maricopa County, week ending January 28. Few scattered, light infestations appearing in barley and wheat in Yuma, Maricopa and Pinal Counties. (Ariz. Coop. Sur.). KANSAS - Averaged 75 per linear foot in wheat at agronomy farm in Manhattan, Riley County. Temperature below zero later, no snow cover. (Simpson, Jan. 29).

GRAIN APHIDS - CALIFORNIA - *Rhopalosiphum padi* complex and *Macrosiphum avenae* appearing in Fresno County grain. (Cal. Coop. Rpt.).

OMNIVOROUS LOOPER (*Sabulodes caberata*) - CALIFORNIA - Larvae medium on oats in race track area at Albany, Alameda County. Unusually heavy on shrubs and ground cover in 1965 in several locations. (Cal. Coop. Rpt.).

A BILLBUG (*Sphenophorus venatus vestitus*) - FLORIDA - Severely damaging Bermuda grass in South Miami, Dade County. (Habeck).

ALFALFA WEEVIL (*Hypera postica*) - ARKANSAS - Egg deposition studies in alfalfa on Northeast Branch Experiment Station, Mississippi County, continue. Four stem samples of one square foot each showed average of 350,000 eggs per acre. Samples taken in December 1965 and January 1966 indicated about 1,000,000 eggs per acre. (Ark. Ins. Sur.).

A WEEVIL (*Hypera brunneipennis*) - ARIZONA - Adults ranged 10-60 per 100 sweeps in Yuma Valley area alfalfa. Averaged 1 larva per terminal in some fields. In Maricopa County, adults remain low; however, egg deposits numerous in Buckeye and Chandler areas and along Baseline Road. (Ariz. Coop. Sur., Jan. 28).

LEAFHOPPERS - FLORIDA - Severe cold at Gainesville, Alachua County, caused reduction in insect numbers. Adults of following species found in 100 sweeps on bitter blue lupine: 5 *Cuerna costalis*, 1 *Macrosteles fascifrons* and 1 *Diabrotica undecimpunctata howardi*. Following species found in 100 sweeps on rye: 1 *M. fascifrons* adult, 3 *Graminella nigrifrons* adults and 30 *Macrosiphum avenae* nymphs. (Mead).

PEA APHID (*Acyrthosiphon pisum*) - ARIZONA - Few scattered, medium to heavy infestations noted in Yuma Valley alfalfa week ending January 28; as high as 4,000 per 100 sweeps. Averaged 200 per 100 sweeps in Roll and upper Yuma Valley areas, 800 per 100 sweeps in Somerton area, Yuma County. Remains light in Pinal and Maricopa Counties. (Ariz. Coop. Sur.). NEW MEXICO - Continued light in alfalfa in northern Eddy and Chaves Counties, week ending January 28. (Kloepfer, Mathews). Light in some fields in Lea County. (Mathews).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - ARIZONA - Continued light in alfalfa in Maricopa and Pinal Counties. Medium in some Yuma County fields. (Ariz. Coop. Sur.).

FRUIT INSECTS

Citrus Insect Situation in Florida - End of January - CITRUS RUST MITE (*Phyllocoptruta oleivora*) infested 66 percent of groves (norm 57 percent); 49 percent economic (norm 39 percent). Population still above normal but tending to decrease to moderate level. All districts heavy in at least 5 percent of groves. Highest districts south, west, north. TEXAS CITRUS MITE (*Eutetranychus banksi*) infested

31 percent of groves (norm 26 percent); 15 percent economic (norm 9 percent). Population slightly above average but at low to moderate level. Less than 6 percent of groves heavy. Highest districts west and north. CITRUS RED MITE (Panonychus citri) infested 32 percent of groves (norm 33 percent); 12 percent economic (norm 10 percent). At low level normal for January in recent years. Less than 5 percent of groves heavy. Highest districts east and west. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) remains at very low level. GLOVER SCALE (Lepidosaphes gloverii) infested 78 percent of groves; 12 percent economic. Population normal; highest district south. PURPLE SCALE (Lepidosaphes beckii) infested 82 percent of groves; 5 percent economic. Population normal; highest district south. YELLOW SCALE (Aonidiella citrina) infested 70 percent of groves; 21 percent economic. Population above average and destructive in scattered groves, mostly in central district. Highest districts central and east. CHAFF SCALE (Parlatoria pergandii) infested 60 percent of groves; 10 percent economic. Population near normal low for January. Highest district south. BLACK SCALE (Saissetia oleae) infested 49 percent of groves; 26 percent economic. Normal for January is 32 percent infested, 14 percent economic. Highest districts central and east. WHITEFLIES infested 64 percent of groves; 4 percent economic. Population near normal; slight increase expected. Highest district east. Major cold spell of January 30-31 unlikely to change pest situation greatly unless cold damage results in severe defoliation and dead wood. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred)).

SIX-SPOTTED MITE (Eotetranychus sexmaculatus) - CALIFORNIA - Medium on citrus locally in San Diego, San Diego County. (Cal. Coop. Rpt., Jan. 28).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Medium on olive trees in Del Rey, Fresno County. (Cal. Coop. Rpt.).

SAN JOSE SCALE (Aspidiotus perniciosus) - NEW MEXICO - Moderate to heavy and apparently killing Hopa crab apple trees at Farmington, San Juan County. (Heninger).

For Other Fruit Insects, see Federal-State Plant Protection Programs, page 83.

TRUCK CROP INSECTS

FALSE CELERY LEAF TIER (Udea profundalis) - CALIFORNIA - Larvae locally light on table beets and lettuce in San Joaquin and Fresno, Fresno County. (Cal. Coop. Rpt., Jan. 28).

A LEAF ROLLER MOTH (Ptycholoma peritana) - CALIFORNIA - Larvae medium on leaves of table beets in Selma, Fresno County. (Cal. Coop. Rpt.).

A NOCTUID MOTH (Pseudoplusia includens) - TEXAS - Larvae heavy locally on cabbage in Webb County. (Deer, Jan. 28).

GREEN PEACH APHID (Myzus persicae) - CALIFORNIA - Nymphs medium on leaves of table beets in Selma, Fresno County. Populations extremely early in this area. (Cal. Coop. Rpt.).

LYGUS BUGS (Lygus spp.) - ARIZONA - Medium in most sugar beet seed fields in Maricopa County. (Ariz. Coop. Sur.).

SAY STINK BUG (Chlorochroa sayi) - ARIZONA - Light in sugar beet seed fields in Maricopa County. (Ariz. Coop. Sur.).

ONION THRIPS (Thrips tabaci) - ALABAMA - Considerable damage with 5 percent loss of onions on 0.3 acre in Escambia County where populations extremely heavy. All plants affected; reducing sale quality. (Knowled, Hendrix, et al.).

Beet Leafhopper - See Federal-State Plant Protection Programs, page 83.

COTTON INSECTS

PINK SCAVENGER CATERPILLAR (Sathrobrota rileyi) - CALIFORNIA - Light to medium in gin trash collections in Brawley-Holtville-Westmorland areas, Imperial County, week of January 28. Heavy larval numbers recovered from gin trash in Calipatria, Imperial County. (Cal. Coop. Rpt.).

For other Cotton Insect notes, see Federal-State Plant Protection Programs, page 83.

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) - ALABAMA - Adults and larvae slightly active along and below ground line in affected pines throughout State. (McQueen).

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - TEXAS - All known multiple-tree infestations controlled by December 20, 1965. (Texas For. Pest Comm.; Dec. Rpt., Williamson).

A CONIFER APHID (Cinara tujafilina) - NEW MEXICO - Widespread and light to moderate on arborvitae in Farmington area, San Juan County. (Heninger). OKLAHOMA - Recent cold weather has not materially reduced infestations on arborvitae in Stillwater area, Payne County. (Okla. Coop. Sur.).

BLACK PINE-LEAF SCALE (Nuculaspis californica) - CALIFORNIA - Medium on white fir trees in Placerville area of El Dorado National Forest. (R. Miller, USFS).

DOGWOOD BORER (Thamnosphecia scitula) - ALABAMA - Larvae in affected dogwood in central part of State slightly active and feeding during warmer periods; not affected by zero temperatures January 29 and 30. Some pupation noted. (McQueen).

A NOCTUID MOTH (Protorthodes rufula) - CALIFORNIA - Larvae of this species and of a crane fly locally heavy in dichondra in Santa Maria, Santa Barbara County. (Cal. Coop. Rpt.).

A NYMPHALID BUTTERFLY (Vanessa sp.) - CALIFORNIA - Larvae heavy on malva in Encinitas, San Diego County. (Cal. Coop. Rpt., Jan. 28).

SCALE INSECTS - FLORIDA - Ceroplastes floridensis moderately damaged 4,500 of 5,000 ixora plants in nursery at Winter Haven, Polk County. (Eisenschenk, Jan. 6). CALIFORNIA - Lecanium persicae heavy on daphne plants in Santa Rosa, Sonoma County. (Cal. Coop. Rpt.). Toumeyella pinicola and Holcocera iceryaeella (a blastobasid moth) heavy on Monterey pine in Vandenburg Air Force Base, Santa Barbara County. (R. Bloomstrom, USFS). Coccus hesperidum and Abgrallaspis cyanophylli heavy on yucca nursery stock in Lodi, San Joaquin County. Phenacoccus defectus and Eriococcus coccineus medium on leaves and roots of sempervivum nursery stock at Lodi. (Cal. Coop. Rpt.).

MEALYBUGS - CALIFORNIA - Pseudococcus adonidum medium on New Zealand-flax nursery stock in Menlo Park, San Mateo County. (Jan. 28). Planococcus citri heavy locally on gold spot croton nursery stock in Redding, Shasta County, and on mimosa nursery stock in Escondido, San Diego County. (Cal. Coop. Rpt.).

A MEALYBUG (Humococcus atriplicis) - CALIFORNIA - Light on roots of Atriplex canescens in Holtville, Imperial County. This is a new county record. (Cal. Coop. Rpt.).

PEA LEAF MINER (Liriomyza bryoniae) - CALIFORNIA - Adults medium on chrysanthemum in Encinitas, San Diego County. (Cal. Coop. Rpt., Jan. 28).

A SPHECID WASP (Ectemnius spiniferus) - CALIFORNIA - Larvae heavy and damaging flowering cherry nursery stock in Lemoore, Kings County. (Cal. Coop. Rpt., Jan. 28).

SPIDER MITES (Tetranychus spp.) - ALABAMA - Adults, nymphs and eggs continue heavy on isolated plantings of roses, laruelcherry, azalea and other ornamentals in Lee County following zero temperatures January 29-30. Damage minor in most instances, but continuing population and multiplication on ornamentals throughout central and southern areas under extreme weather conditions noteworthy. (McQueen). CALIFORNIA - T. marianae medium on nightshade locally in Fullerton, Orange County. This is a new county record. (Cal. Coop. Rpt.).

CARMINE SPIDER MITE (Tetranychus telarius) - CALIFORNIA - Medium on wild nightshade locally in Fullerton, Orange County, and on Ajuga sp. nursery stock in Fresno, Fresno County. (Cal. Coop. Rpt., Jan. 28).

AN ERIOPHYID MITE (Aceria abalis) - CALIFORNIA - Nymphs and adults heavy on California mugwort (Artemisia vulgaris) in Fullerton, Orange County. (Cal. Coop. Rpt., Jan. 28).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - LOUISIANA - Larval collections by Jefferson Parish Department of Mosquito Control, January 24-28, contained Aedes sollicitans, A. taeniorhynchus, A. vexans, Anopheles quadrimaculatus, Culex restuans, Culex salinarius and Culiseta inornata. Light trap collections decreased due to colder weather. Larval collections during week ending February 4 contained Aedes sollicitans, A. vexans, Anopheles quadrimaculatus, Culex salinarius and Culiseta inornata. Light trap collections showed sharp decrease due to unusually cold and freezing weather. Culiseta inornata predominated in traps. (Stokes).

COMMON CATTLE GRUB (Hypoderma lineatum) - NEW MEXICO - Averaged 6.3 per head in 9 untreated cattle at Clayton, Union County; ranged 0-21 per animal; none found in 2. Averaged 6.6 per head in 20 untreated animals; ranged 0-18 per animal; none in 2. (Kinzer). OKLAHOMA - Ranged 10-15 per head on yearlings, averaged 6 per head on cows in Noble County; moderate in Hughes County. (Okla. Coop. Sur.). UTAH - Hypoderma spp. appearing in Cache County. Treatment underway on dairy and beef cattle throughout county. (Knowlton, Jan. 31).

BROWN DOG TICK (Rhipicephalus sanguineus) - ARIZONA - Continues heavy in Yuma area despite cool weather. (Ariz. Coop. Sur.).

PACIFIC COAST TICK (Dermacentor occidentalis) - CALIFORNIA - Tick paralysis occurred in herd of cattle in Copperopolis-Bear Mountains area, Calaveras County. Treated animals recovered promptly; entire herd of several hundred beef cattle sprayed. (Cal. Coop. Rpt.).

CATTLE LICE - OKLAHOMA - Several species ranged 2-3 per hair part on cows in Noble County. Heavy in Hughes County. (Okla. Coop. Sur.).

TROPICAL RAT MITE (Ornithonyssus bacoti) - CALIFORNIA - Infesting residence and annoying occupants in Carmichael, Sacramento County. (Cal. Coop. Rpt., Jan. 28).

NORTHERN FOWL MITE (Orinthonyssus sylviarum) - ARKANSAS - Locally heavy in Benton County. (Ark. Ins. Sur.).

HOUSEHOLD AND STRUCTURAL INSECTS

A FIELD CRICKET (Gryllus sp.) - ARIZONA - Recent hatch causing concern to many homeowners in Yuma County. (Ariz. Coop. Sur.).

CLOVER MITE (*Bryobia praetiosa*) - NEW MEXICO - Light to heavy and very annoying in and around homes and business establishments at Farmington, San Juan County. (N. M. Coop. Rpt.).

STORED-PRODUCT INSECTS

BROWN-SPIDER BEETLE (*Ptinus clavipes*) - CALIFORNIA - Adults medium in dry yeast in wholesale house in West Sacramento, Yolo County. (Cal. Coop. Rpt., Jan. 28).

CIGARETTE BEETLE (*Lasioderma serricorne*) - CALIFORNIA - Adults heavy in imported fish meal in Edgemont, Riverside County. (Cal. Coop. Rpt., Jan. 28).

FEDERAL-STATE PLANT PROTECTION PROGRAMS

BEET LEAFHOPPER (*Circulifer tenellus*) - CALIFORNIA - Treatment of overwintering concentrations in breeding grounds of western San Joaquin Valley completed January 19 on 11,000 acres; 97 percent mortality achieved. (Cal. Coop. Rpt.).

CITRUS WHITEFLY (*Dialeurodes citri*) - CALIFORNIA - Progress good this period; 53 city blocks sprayed in Sacramento, Sacramento County. About 40 percent of area to be treated completed. Approximately one-half of treatment area treated in Fresno, Fresno County. (Cal. Coop. Rpt.).

A FRUIT FLY (*Anastrepha suspensa*) - FLORIDA - Four adults taken in Steiner traps January 15-21 in known infested area. Unusual for species to be taken in Steiner traps. Large adult numbers around trees prompted cutting of fruit and recovery of one larva in Temple orange in Palm Beach County commercial grove. *A. suspensa* collections during last week of January reveal larvae and adults still common. Larvae most abundant in calamondins; also taken in fruits of guava, kumquat, and loquat. All collections from Dade, Palm Beach, and Broward Counties. (Fla. Coop. Sur.).

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - ALABAMA - Observations in Macon, Lee and Tallapoosa Counties indicate active populations somewhat higher than in past years; 75 or more hills per acre noted in many open pastures. (Barwood).

PINK BOLLWORM (*Pectinophora gossypiella*) - ARIZONA - Larvae continue to be found on lint cleaner from gins in Queen Creek area. Field inspections in Yuma County revealed 2 larvae in one field in Yuma Valley, 1 larva near Somerton and 7 larvae in Gadsden-San Luis areas. In southern Yuma County to date, 31 larvae found in 17 fields comprising 935 acres. (Ariz. Coop. Sur., Jan. 28). CALIFORNIA - Two separate single larval collections made in gin trash in Bard Valley, Imperial County, during January. (Cal. Coop. Rpt.). NEW MEXICO - Live larvae found in standing stalks and on surface of ground in Chaves and Eddy Counties. In an area near Carlsbad, 17 live larvae found in 9 bolls January 10. Of 24 cocoons collected from cotton roots near Hagerman, Chaves County, 21 larvae alive. Even though temperature dropped to 10 degrees below zero, live larvae still found in seed cotton on ground in field near Artesia, Eddy County. (Judd).

A WEEVIL (*Anthonomus* sp.) - ARIZONA - Four adults found in an approximate 3-cubic-foot trash collection taken from under mesquite tree in Pinal County. (Ariz. Coop. Sur.).

LIGHT TRAP COLLECTIONS

GEORGIA (Tifton, 1/26-2/3; temp. 10-54°F.; precip. 0.15 in.; blacklight) - *Heliothis zea* 0, *H. virescens* 0, *Manduca quinquemaculata* 0, *M. sexta* 0.

(Light trap collections continued on page 84).

SOUTH CAROLINA (Charleston, 1/17-23; temp. 25-52°F.; precip. 1.52 in.; blacklight) - Pseudaletia unipuncta 1, Spodoptera frugiperda 0, Prodenia ornithogalli 2, Agrotis ipsilon 1, Feltia subterranea 0, Peridroma saucia 0, H. zea 0, H. virescens 0, M. sexta 0, M. quinquemaculata 0, Estigmene acrea 0, Trichoplusia ni 0.

TEXAS (Brownsville, 1/29-2/4; temp. 37-71°F.; precip. 0.0 in.; 2 blacklight) - A. ipsilon 24, E. acrea 1, F. subterranea 13, P. ornithogalli 1, P. unipuncta 74.

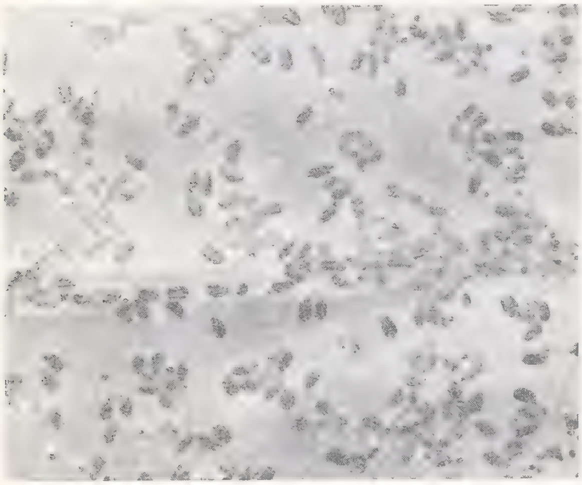
CORRECTIONS

CEIR 16(5):68 - A FALSE SPIDER MITE (Tenuipalpus pacificus) - FLORIDA - Note should read: Caused moderate to severe damage to leaves of 3,800 of 38,000 orchid seedlings at Homestead, Dade County. (Knowles, Jan. 21).

INSECT DETECTION

Look for Black Parlatoria Scale Now

Look in citrus groves and backyard plantings for a flat, black, opaque scale, rectangular to oval in shape, about 1 to 1.5 mm. in length. This scale is prominent on fruit and top side of leaves.



Parlatoria zizyphus (Lucas) prefers citrus; however, there are a few reports of the pest on some other plants. The scale is distributed in Europe, Asia (including Iran, Lebanon, Cyprus), parts of Africa (Morocco, Algeria, Egypt, Ethiopia, Tunisia, Libya, southern Africa) and some other areas. It is not known to occur in the United States. P. zizyphus is one of the major pests of citrus in southern Europe, Tunisia and China; also important in Iran, Libya and Ethiopia. Infestations are difficult to control.

For more details see CEIR 10(8):111-112.

An Ephydrid Fly from Sugar Beets

In 1963, an ephydrid fly, Psilopa leucostoma (Meigen), was reported as a leaf miner of sugar beets in southeastern Washington by B. J. Landis. Since then, this fly was found attacking sugar beets in Oregon in the Milton-Freewater area in 1964 and in the Ontario-Nyssa area in 1965. Also in 1965, this pest was found at Parma and in other beet-producing areas eastward throughout Idaho, and at Tremonton, Utah. (B. J. Landis).

New County Records

A MEALYBUG (Humococcus atriplicis) on roots of Atriplex canescens in Imperial County, California. (p. 81).

A SPIDER MITE (Tetranychus marianae) on nightshade in Orange County, California (p. 82).

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

During the period January 30-February 5 no cases were reported in the United States. The Republic of Mexico reported 20 cases as follows by State: Sonora 7, Chihuahua 1, Tamaulipas 4 and Territorio sur de Baja California 8. Sterile screw-worm flies released: Texas 566,250 and Mexico 88,202,000.

Table 1. Comparison of specimens reported during corresponding week in 1964 and 1965 in Southwestern Eradication Area. (1966 area figures include cases reported from Arizona and/or California; 1965 figures reflect those from the 5-State area).

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
1964	0	0	27	158	0.00	0.00
1965	0	4	33	320	0.00	1.25
1966	0	25	6	114	0.00	21.92

Table 2. Comparison of specimens reported during corresponding week and in a corresponding area in 1965 in the United States-Mexico Barrier Zone.*

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
1965	103	323	29	197	355.17	163.95
1966	20	315	9	98	222.22	321.42

Feasibility Survey - During this period 203 cases were identified in Mexico south of the Barrier Zone as follows: Jalisco 23, Colima 6, Yucatan 24, Veracruz 28, Chiapas 16, Puebla 6, Guerrero 19, Michoacan 5, Sinaloa 28, Morelos 2, Oaxaca 11, Nayarit 5, Tabasco 7, San Luis Potosi 4, Queretaro 1, Hidalgo 1, Durango 8, Zacatecas 1, Guanajuato 7, Territorio de Quintana Roo 1.

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* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm populations in the United States. (Anim. Health Div.).

HAWAII INSECT REPORT

Fruit Insects - CHINESE ROSE BEETLE (*Adoretus sinicus*) adults medium to heavy on leaves of Isabella grape (*Vitis labrusca*) in Waimea and Hanapepe, Kauai. Young terminal leaves also destroyed.

Truck Crop Insects - SOUTHERN GREEN STINK BUG (*Nezara viridula* var. *smaragdula*) very light on various crops in Lihue, Hanamaulu and Kapaia, and light on legumes and other crops at Agricultural Experiment Station in Waialua, Kauai. Increasing on weed hosts and vegetable crops in some localities on Oahu. GREENHOUSE WHITEFLY (*Trialeurodes vaporariorum*) medium on older leaves of snap beans and tomato in Waimea Valley, Kauai, and light on tomato and pole bean leaves in Waiakoa, Maui. SOUTHERN GARDEN LEAFHOPPER (*Empoasca solana*) caused heavy damage to endives and chickory in Waimea, Kauai. Typical "hopperburn" observed on older leaves. MELON APHID (*Aphis gossypii*) and *Liriomyza* sp. light on tomato in commercial farms in Kihei, Waiakoa and Olinda, Maui. Larvae of IMPORTED CABBAGEWORM (*Pieris rapae*) light on head cabbage in Kihei, Waiakoa, and Olinda, Maui. AN APHID (*Macrosiphum* sp.) light on potato from Kihei to Olinda, Maui.

Forest, Ornamental and Shade Tree Insects - GREENHOUSE ORTHEZIA (*Orthezia insignis*) heavy on *Asystasia coromandeliana* from Kihei to Olinda, Maui; severely damaged plants in some areas died. CUBAN-LAUREL THRIPS (*Gynaikothrips ficorum*) light on leaves of Chinese banyan (*Ficus retusa*) in scattered areas in Oahu. Heavy infestations of an ARMORED SCALE (tentatively determined *Phenacaspis cockerelli*) occurred on oleander and coconut leaves in Keauhou and Honaunau, Hawaii; moderate to heavy on oleander leaves in Honolulu and Lanikai, Oahu. HEMISPHERICAL SCALE (*Saissetia hemisphaerica*) light on midribs of plumeria leaves (7 adults per leaf) and moderate to heavy on terminal parts of stems of paper-gardenia (*Ervatamia divaricata*) causing malformation of terminal buds in Honolulu, Oahu.

Insects Affecting Man and Animals - Heavy populations of house fly (*Musca domestica*) reported from Hanapepe, Kauai. Large numbers of a MILICHIID FLY (*Milichiella circularis*) swarming above sugar cane trash and mill wastes in Kekaha, Kauai. Becomes nuisance due to habit of hovering around moving objects.

Beneficial Insects - Increasing larval activity of an ARCTIID MOTH (*Selca brunella*) causing heavy damage to flower buds, fruits, leaves, and terminal stems of Indian-rhododendron (*Melastoma malabathricum*) in Kulani area of Hilo, Hawaii. Larvae noted about one mile from original release point. *S. brunella* was introduced from Malaysia in 1964 for bio-control of *M. malabathricum*. Light larval numbers of a TEPHRITID FLY (*Tetraeuaresta obscuriventris*) feeding on seeds of tropical American elephants-foot (*Elephantopus mollis*) in Omao and Kalaheo, Kauai; medium in Lawai, Kauai, where seed heads nearing maturity. *T. obscuriventris* introduced for control of *E. mollis*. An ANTHOCORID BUG (*Montandoniola moraguesi*) very active and exerting strong pressure on Cuban-laurel thrips; 1-2 adults and 4-6 nymphs per thrips-infested leaf counted at Makiki Heights, Oahu. (Davis).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1965

INTRODUCTION

The summary of insect conditions, beginning in this issue, will be continued in several succeeding issues of the Cooperative Economic Insect Report. This was compiled in Survey and Detection Operations from annual summaries that were submitted by various State and Federal cooperators. A list of the individuals who assisted in assembling data, as well as a summary of the weather for 1965, will appear after the last section of this summary is published. Survey and Detection Operations appreciates the assistance of all individuals who have participated in the preparation of material for the 1965 summary.

CEREAL AND FORAGE INSECTS

GRASSHOPPERS

Highlights:

GRASSHOPPERS may be more of a problem on rangeland in the West and Midwest in 1966 than they were last year. More than 16.6 million acres of rangeland were found infested with economically significant numbers in 13 States during surveys conducted in fall of 1965. This is almost twice the 8.7 million acres infested in these States the previous fall. Although infestations were mostly noneconomic in North Dakota, threatening numbers may occur in a small area in Adams and Golden Valley Counties in 1966. Infestations increased on South Dakota rangeland, where threatening to severe numbers exist in several areas. East of the Missouri River, areas of infestation changed decidedly compared with 1964. Indications are for relatively high and damaging populations in eastern portions of that State in 1966. Although grasshoppers increased in some areas of Minnesota, the general outlook for 1966 is for somewhat lower populations. Cool weather resulted in a late hatch of grasshopper eggs in Wisconsin, and prolonged development which resulted in low adult density; therefore, populations may be low again in 1966. Populations were the lowest in many years in Illinois, were economically unimportant in Indiana and declined in Ohio.

Grasshoppers were of some concern during 1965 in the more western States. Economic rangeland species increased in areas of Washington. In California, grasshoppers posed a threat early in the season but damaging populations failed to develop. Populations were at low levels in Nevada during the year, but in Utah, grasshoppers caused considerable damage to crops and rangeland, conservatively estimated at 2.5 million dollars. No losses occurred in Colorado, but several species caused slight to moderate damage to various crops in northern Wyoming. Damage to crops and rangeland were minimal in Montana due to above normal moisture during the summer months. Grasshoppers were generally heavy over Texas, especially in the Rolling Plains, and populations were heavy in many areas of Oklahoma, where controls were necessary in many sections. Grasshopper populations increased to damaging numbers late in the year in Alabama, with most serious damage occurring to winter clovers in southern and central counties. Grasshoppers were numerous on tobacco in 2 south central counties of Virginia where drought conditions prevailed during the year. Weather conditions during the spring and summer months will have an influence on the development of populations. A map showing the results of the adult survey for 1965 was carried in CEIR 16(4): following page 64.

The GRASSHOPPER fall adult survey for 1965 showed mostly noneconomic infestations over NORTH DAKOTA, with light to threatening infestations indicated in several areas for 1966. Threatening numbers may occur in a small area in Adams and Golden Valley Counties in 1966 also. Localized light infestations occurred during 1965 on rangeland in western North Dakota in Slope, Billings, Golden Valley, McKenzie, Dunn and Williams Counties. Considerable grasshopper damage appeared along cropland margins in eastern areas of the State late in the season. The principal species involved were Melanoplus sanguinipes and M. bivittatus. Areas of threatening to severe grasshopper infestations in SOUTH DAKOTA exist in parts of Roberts, Grant, Day, Brown, Spink, Clark, Beadle, Brule, Jerauld, Sanborn, Aurora, Davison, Hanson, McCook, Lake, Moody, Minnehaha, Gregory, Tripp, Todd, Corson, Dewey and Zeibach Counties. Areas of light to threatening infestations cover most of the remaining portions of those counties east of the Missouri River and approximately half of the land area west of that river. East of the Missouri River, there was a decided change in areas of infestation from 1964 when grasshopper populations were mostly noneconomic to light. Rangeland infestations have increased. A long, cool spring in 1965 resulted in an extended period of grasshopper egg hatch in South Dakota and slowed development. A relatively wet summer minimized grasshopper damage to both crops and rangeland plants. An extended warm period during the fall months resulted in additional feeding by grasshoppers on late crops and continued egg laying. The weather in 1966 will be the key factor regarding damaging grasshopper populations which, by all indications, will be relatively high in eastern areas of South Dakota this year. Grasshopper control in South Dakota during 1965 was affected by chemical and biological means. An estimated 130,000 acres of crops and rangeland, including roadsides, field borders and fields were sprayed with recommended insecticides. In certain areas of the State, particularly the south central section, blister beetle populations, including Epicauta fabricii, E. pennsylvanica and E. maculata were noted. By the end of June, grasshopper populations had built up to economic proportions in the Elk Mountain area of western Custer County, where Ageneotettix deorum was the dominant rangeland species. In other areas of South Dakota, common species present in light to noneconomic numbers included Melanoplus bivittatus, M. differentialis, M. femurrubrum and M. sanguinipes. During surveys conducted in July, 2 additional species noted were Aulocara elliotti and M. packardii.

Light grasshopper populations caused little damage in NEBRASKA during the 1965 season. Some light concentrations, mainly Melanoplus femurrubrum, M. differentialis, M. bivittatus, M. sanguinipes and Phoetaliotes nebrascensis, were found in some portions of northwest, north, northeast and central Nebraska. These infestations occurred in red clover, idle land, legumes and small pastures. An estimated 10,000 acres were treated to protect crops. Grasshopper populations were lighter generally in Nebraska during 1965 than the previous year. In KANSAS, grasshopper populations remained low in most areas, with control measures applied against a few local buildups in southeast and central areas of the State. Melanoplus spp. occurred only in a few small areas in southeast, east central, west central and southwest MISSOURI. Populations were light everywhere except for a small spot in Douglas County, a narrow band from Newton County to Cedar County, and a small area in Henry County which was rated as moderate. Damage was noneconomic throughout Missouri during the 1965 season except in a few fields of corn in areas where numbers were moderate. The principal species in Missouri in 1965 were Melanoplus differentialis, M. femurrubrum and M. sanguinipes.

Grasshopper populations increased in several areas of MINNESOTA despite above normal rainfall and below normal temperatures throughout the 1965 season. Spring egg hatch was later than usual but a brief rainless period resulted in excellent nymphal survival. Cool, wet weather slowed development during the summer. Damage was generally not evident due to lush plant growth. Some late season movement of grasshoppers into corn and soybeans was observed, but severe damage was generally limited to marginal rows. Alfalfa was severely defoliated in occasional fields in numerous counties, but as in the past, infestations were scattered and localized. Areas of very severe infestation occurred only in Dakota and northern Goodhue Counties, and severe infestations occurred mainly in southeastern Minnesota counties. Threatening grasshopper infestations occurred over large areas of central and west central sections and small areas of threatening populations were noted in a few southwest and northwest counties. Infestations were light generally over the western third of Minnesota and in the southeastern corner. Alfalfa was the primary host and Melanoplus femurrubrum continued to predominate in all areas during 1965. A limited grasshopper egg survey in October showed that only 7 percent of the fields surveyed contained egg numbers as high as adult populations indicated. Cool, wet weather from late August through September probably resulted in low egg deposition, with adult mortality probably being high in most areas at the same time. This would indicate that grasshopper populations in Minnesota in 1966 would be somewhat lower than they were in 1965. Egg hatch and nymphal survival in the spring of 1966, if weather conditions are good, could alter this outlook to some extent, however. In WISCONSIN, late hatching, unusually prolonged development and a low density of adult grasshoppers due to cool weather were significant in 1965. Little damage was noted and egg laying was probably less than normal, indicating a possibility of low grasshopper populations again in 1966. Eggs began hatching in mid-May. Melanoplus sanguinipes appeared first, and late in May nymphs of M. femurrubrum and M. differentalis were observed. M. sanguinipes adults were first observed in mid-June and those of M. bivittatus were noted late the same month. First instar nymphs of M. femurrubrum were common well into July, indicating a prolonged hatch. Adults first appeared in Wisconsin the third week in July, although immatures predominated well into September. Cool weather probably prolonged development so late in the 1965 season. The late maturing of grasshoppers in Wisconsin may have resulted in reduced egg laying; and survey, although not conclusive, indicated that this was true.

Melanoplus spp. populations in ILLINOIS were the lowest in many years. Treatments were applied to a total of 64,570 acres of cropland for control of grasshoppers in the State during 1965, compared with 219,626 acres in 1964, 672,433 acres in 1963 and 1,472,645 acres in 1962. Grasshoppers were not economically important in INDIANA during the 1965 season, and there were no reports of infestations that required control measures. In MICHIGAN, grasshopper adult and nymphal numbers were relatively low during the year. An average of 2 per square yard was recorded for 10 fields surveyed during mid-September in Mecosta, Osceola and Missaukee Counties. In one isolated field, counts as high as 15 per square yard were noted. M. femurrubrum was the dominant grasshopper species found at that time in Michigan. Grasshopper distribution decreased and populations declined in OHIO during 1965 compared with 1964. Counts were less than one per square yard throughout most northern sections of the State during September and October. Highest populations occurred in south and southeast areas, where counts ranged 3-10 per square yard. Melanoplus femurrubrum was estimated to comprise 98 percent of grasshopper field populations in Ohio. M. femurrubrum nymphs were observed in forage, soybeans and stubble in central and south central sections during July and adults were collected in September. M. differentialis was seldom observed, possibly due to early dispersal from hatching sites, although the species was frequently encountered a year ago. Epicauta pennsylvanica was the most common grasshopper predator and was usually observed in older fields of alfalfa and clover.

Grasshoppers were of some concern during the 1965 season in the more western States. Economic species increased greatly in WASHINGTON over the 1964 season in rangeland areas of northern Walla Walla, Columbia and Garfield Counties and in Franklin, Whitman and Asotin Counties. Economic infestations occurred on 246,000 acres during 1965, an increase of 229,000 acres over those infested in 1964. Melanoplus sanguinipes, M. packardii and M. bivittatus were dominant, except in Asotin County where M. femurrubrum appeared to dominate. Grasshopper emergence was earlier than in 1964, with about 50 percent adults being present by July. Damage to rangeland in Washington greatly increased during the 1965 season; however, little cropland was affected, except in northern Columbia and Garfield Counties. Grasshoppers were moderate or above on approximately 500,700 acres in OREGON during 1965, of which 1,050 acres were treated. Populations in western parts of the State were lower than during 1964, but generally higher in eastern and southern areas of the State. Camnula pellucida was the dominant species in Oregon this season. Adequate rainfall produced abundant vegetation over most of CALIFORNIA in 1965. Early indications were that grasshoppers posed a threat to croplands in the State, but damaging populations failed to develop. Scattered, light populations occurred in areas where these pests were noticeably absent during past 4 years due to a fungus, Entomophthora grylli. Grasshoppers appeared on rangeland in Calaveras County in April and were a problem through the season. Grasshoppers were of concern primarily in northern counties with infestations occurring on range, pasture, grain and alfalfa in Siskiyou County, home gardens in Tehama County, pastures, grapes and walnuts in Amador County; infestations were general and light in Placer County, local on range in Humboldt, Plumas and Sierra Counties, and scattered on pastures in Fresno County. There were no large scale grasshopper control programs in California during 1965, as most control was done by individuals. The only control program in the State was on 1,800 acres of rangeland in Siskiyou County.

Grasshopper populations were at low levels in NEVADA during 1965. The fall adult survey in 1964 indicated potential infestations on 172,000 acres for 1965, but economic populations only developed on 2,500 acres, mostly in Elko County. Populations were composed of Aulocara elliotti, Melanoplus bivittatus, M. packardii, M. sanguinipes and Oedaleonotus enigma. Large numbers of grasshopper adults were killed by fungus in Elko and White Pine Counties during late August and September. The 1965 adult grasshopper survey indicates infestations on 50,640 acres, the lowest in the past few years in Nevada, with major infestations in Churchill, Elko, Pershing and White Pine Counties. Populations of Schistocerca shoshone were heavy on elms in Clark County during the 1965 season. Grasshopper populations were very high and caused considerable damage in UTAH during 1965. The most extensive outbreaks occurred in Sanpete, Box Elder, Juab, Millard, Iron, Utah, Salt Lake, Tooele, Davis and Emery Counties, and generally along the Wasatch Front. Damage to crops and rangeland was conservatively estimated to exceed 2.5 million dollars. This damage would have been more severe except for excellent plant conditions due to abundant spring and summer moisture. The dominant damaging grasshoppers in Utah this season were Melanoplus sanguinipes, Camnula pellucida, Aulocara elliotti, Oedaleonotus enigma, M. bivittatus and M. packardii. Control programs were estimated to have exceeded 600,000 acres sprayed, in addition to which, 1,800 acres were baited in the Howell-Blue Creek area of Box Elder County to protect fall grain. Late, fall surviving grasshoppers were damaging on several thousand acres. The adult fall survey indicated that grasshoppers threaten damage to at least 162,425 acres of cropland and 215,625 acres of rangeland in Utah during 1966.

Grasshoppers caused no losses in any area of COLORADO during 1965. They were of minor importance on alfalfa and present in borders of some fields in the dryland-bean producing area of the southwest. Grasshoppers are expected to be light on pastures and rangeland in Colorado during 1966. Several species of grasshoppers caused slight to moderate damage to alfalfa, grain and corn in northern areas of WYOMING during 1965. Counts averaged 12-15 per square yard in heavily infested fields in Big Horn County and 2-18 in other areas. Much control work was done on cropland in the Lovell area of Big Horn County. First spraying of the season in Wyoming was begun July 6 at Wheatland, Platte County, and the last completed August 15 in the Big Horn Mountains. A total of 339,641 acres was treated in 6 counties and 51,640 acres were treated on the Big Horn National Forest program. Costs in the cooperative program in 6 counties varied considerably due to the necessity of respraying some areas. In Sheridan County areas, 35 percent respray was necessary and over 90 percent respray was required in Converse County areas. Rain was responsible for most of the excessive respray, particularly in Sheridan County. Fall survey indicates that 2,342,000 acres were infested with adults averaging over 7 per square yard compared with 1,156,000 acres found infested in Wyoming in 1964. In MONTANA, the adult grasshopper survey completed in early September showed light to heavy infestations throughout the eastern half of the State. Damage to crops and rangeland during 1965 was minimal because of above normal moisture throughout June, July and part of August

Grasshoppers were generally heavy over TEXAS, particularly in the Rolling Plains area. These pests were very destructive over the State as a whole, with damage occurring to a wide variety of range plants and cultivated crops. In OKLAHOMA, grasshopper nymphs became active in early April and peak adult activity occurred in mid-June. Populations were heavy in many areas of the State, with controls being necessary in several sections. Ageneotettix deorum, Aulocara elliotti, Phlibostroma quadrimaculatum and Melanoplus bivittatus were the dominant species in western areas of the State. In eastern Oklahoma, M. bivittatus, Hesperotettix speciosus, M. differentialis and Boopedon nubilum were dominant in 1965. First-generation grasshoppers appeared throughout ALABAMA from March 25 through April 25, coinciding with emergence of cotton, corn, grasses, legumes and other crops. Although there was no serious loss of stands or early crop destruction, some ragging of young seedlings and plants followed. There was a continuous and overlapping of generations in Alabama, with considerable foliage feeding on lespedeza, kudzu, grain sorghum, Bermuda grasses, Johnsongrass, hybrid Sudan grasses and other forage crops. The most serious damage caused by grasshoppers was perhaps the destruction or weakening of stands of reseeded clovers in grass sods. Grasshoppers built up in light to heavy numbers from September to frost in November, destroying seedlings of winter clovers in isolated areas before the situation could be recognized. This damage was most serious in the south and central portions of Alabama, especially in the prairie Black Belt cattle area of the western section. Important species in the State in 1965 included Melanoplus femurrubrum, M. differentialis and Schistocerca americana. Grasshoppers were generally light in VIRGINIA during the season, but were more numerous on tobacco in certain areas of Mecklenburg and Brunswick Counties where drought conditions prevailed during 1965.

MORMON CRICKET (Anabrus simplex) populations were at low levels in NEVADA during 1965. Surveys showed that 8,500 acres were infested and that the localities of infestations were the same as in 1964. Most populations were light, scattered and noneconomic, with no control measures being undertaken this season. A survey conducted during July in Lander County indicated a possible upsurge in the Mormon cricket population. Several thousand acres of canyon land in Italian and Cottonwood Canyons were infested with late instars which averaged 6 per square yard. There is a possibility that banding and migration may occur in 1966 and this area in Nevada may pose a threat. Mormon cricket proved no threat to crops or rangelands in UTAH this past year. Numbers were too light to justify controls. Light infestations of this cricket were found in Daggett, Uintah, Millard, Sanpete, Tooele, San Juan and Juab Counties.

SMALL GRAIN INSECTS

Highlights:

Outbreaks of ARMYWORM occurred again in 1965 but apparently they were not so severe as in 1964. However, considerable controls were used, particularly where these outbreaks occurred for the second consecutive year. Armyworm appeared too late for controls in Nevada but FALL ARMYWORM was a problem there, in New Mexico, Texas and on the Eastern Shore of Virginia. In most areas, drought or near drought conditions kept these and other noctuids low, but in western Kansas these weather conditions and ARMY CUTWORM resulted in a noticeable kill of wheat. NOCTUIDS were, as a group, the Nation's greatest agricultural problem. Discovery of CEREAL LEAF BEETLE in Illinois and in additional counties in previously infested States of Michigan, Indiana and Ohio resulted in extensions of the regulated areas. Surveys for this pest in 28 other States have been negative. APHIDS, where weather was favorable, built up to high numbers; parasites apparently were not important factors in reducing populations. Damage by HESSIAN FLY was low to very low in most of the Great Plains.

ARMYWORM (Pseudaletia unipuncta) larval outbreaks occurred for the second consecutive year in areas of southwest MICHIGAN. Approximately 2,300 acres were sprayed in St. Joseph County; aerial and ground sprays were also used in Berrien, Cass and Van Buren Counties. Local infestations occurred in spots in Allegan and Ottawa Counties. Field problems began about June 9 (approximately 9 days later than in 1964). The magnitude of the problem was somewhat less than in 1964. Weather and parasitism by Winthemia quadripustulata (a tachina fly) were considered helpful in reducing damage. Infestations caused considerable damage to small grains in southern INDIANA during May and early June. Larvae averaged 2 per square foot in wheat and barley in areas of Washington, Dubois, Gibson and Knox Counties. A few localized infestations in small grains were noted in the northern third of the State the last half of June. Armyworm was not so abundant in ILLINOIS as in 1964. The highest population recorded in any grain field in 1965 was 14 per linear foot. Few larvae were found in whorls of corn and in oats in the northern section in June. An estimated 60,630 acres of small grain were treated to control armyworm. Moths appeared in blacklight traps in WISCONSIN the night of April 29 in the Madison area. Larvae were found in alfalfa, corn, peas and small grains. Although the cool spring appeared favorable for adults, no significant populations developed. Damage by armyworm was insignificant or at most minor. Populations were also low in MINNESOTA. A few reports of light numbers in barley were noted in the northwest district in late July and a few reports of heavy numbers were recorded in the southeast district. In all cases, noncrop areas were involved.

Armyworm damaged some barley in COLORADO. Large numbers of armyworm larvae invaded alfalfa and oat fields in Goshen and Platte Counties, WYOMING, in mid-July. Damage to oats was quite severe in some instances; some fields required insecticides. Larvae averaged 5.5 per square foot in oats and 0.25 in alfalfa. Heavy populations damaged oats and barley in Morrill, Scotts Bluff, Sheridan, Sioux and Box Butte Counties, NEBRASKA. The remainder of the State had only light infestations. Populations were generally noneconomic in KANSAS. The first moth of the season in MISSOURI was trapped in Pemiscot County April 3. Larvae caused moderate to heavy damage in the southeast to small grains with dense, rank growth. Counts ranged up to 15 per square foot in dense growth and up to 25 in downed areas. Predominance of thin stands of grains over remainder of State was not conducive to armyworm development and little or no damage occurred. Armyworm was lighter in small grains in ARKANSAS than in 1964 and less acreage required controls. Moths were active on warm nights all winter. Moderate to heavy, local populations damaged oats interplanted with vetch in Brazos County, TEXAS; larvae also damaged small grains in the north central area. Armyworm larvae were heavy on wheat in Eureka County, NEVADA, in late August but no treatments were applied since the grain was being harvested. In CALIFORNIA, larvae damaged barley in Orange County, Sudan grass in Merced County and rice in Butte County.

Armyworm damaged small grains in northeastern NORTH CAROLINA in mid-May. Large acreages were infested in Currituck and Camden Counties. One field in the latter county averaged 12 larvae per square foot but this count was higher than average for infested fields of that county. Outbreaks occurred on the Eastern Shore of MARYLAND in late May, where corn, pastures and small grains were injured extensively. Many fields required treatments. Adults were rather abundant in blacklight trap collections by the first week in May in DELAWARE. By early June, larvae caused heavy feeding injury in several areas of western New Castle and Kent Counties. No damage by armyworm was reported in VERMONT during the season. Although light trap collections in the fall of 1964 indicated a heavy population, no outbreak occurred. Armyworm was found only occasionally during the season. In MAINE, small adult flights were recorded in Monmouth in late June and early July. Moderate populations, with damage, occurred in Northport area in mid-July.

FALL ARMYWORM (Spodoptera frugiperda) was heavy as usual in the southern counties of NEVADA. Larvae caused considerable damage to cultivated crops in most areas of NEW MEXICO. This was the only time in the past 8 years that this noctuid has become so general in distribution and caused economic damage in the State. In TEXAS, populations were heavy and widespread as in the past several years; locally heavy damage occurred in most areas of the State but not in outbreak proportions.

Fall armyworm became active in mid-July in OKLAHOMA and also caused some damage to wheat in Bryan County in early November. WHEAT HEAD ARMYWORM (Faronta diffusa) was noted in some Oklahoma areas in May. In KANSAS, fall armyworm was more numerous than usual in early summer when it caused considerable damage and concern. However, populations did not continue and little damage occurred to fall wheat and alfalfa. Infestations in barley and several other crops occurred in September in several OHIO counties. A fall armyworm outbreak occurred on the Eastern Shore of VIRGINIA in late September where it attacked rye; controls were necessary. Small, localized infestations occurred in Providence County, RHODE ISLAND, in mid-August, but a report of an infestation in Newport County could not be confirmed. ARMY CUTWORM (Chorizagrotis auxiliaris) created some problems on grain in MONTANA where yields were reduced. Larvae caused severe damage to seedling wheat near Golva, NORTH DAKOTA, during late May; 60 acres of a 100-acre field were destroyed. In COLORADO, army cutworm damaged wheat and barley and PALE WESTERN CUTWORM (Agrotis orthogonia) damaged wheat. Locally moderate populations of army cutworm were noted in NEBRASKA in April and May. Populations were light to moderate in the spring in KANSAS where numbers were highest in the western half of the State. Army cutworm, in conjunction with an early drought, resulted in a noticeable kill of alfalfa and wheat in some western fields. Light traps in the fall indicate a very minor flight and little concern is expected in the spring of 1966. Army cutworm caused some damage in OKLAHOMA.

CUTWORMS constituted the most serious insect problem of the season in NEW HAMPSHIRE; climbing species were particularly troublesome statewide. Sphaelotis spp., Septis spp. and Euxoa spp. were predominant. CLAY-BACKED CUTWORM (Agrotis gladiaria) was general and severe in some local areas and fields in PENNSYLVANIA. Cutworms as a group were more general and damaging than in past years in CALIFORNIA on cereal and forage crops.

CORN EARWORM (Heliothis zea) activity began in early April in OKLAHOMA; occasionally heavy infestations were found on grain during August. Activity continued until early October. H. zea was not so serious in 1965 as it usually is. SALTMARSH CATERPILLAR (Estigmene acrea) damaged wheat in northwest Oklahoma from late October to late November. Larvae ranged up to 0.5 per square yard.

Discovery of CEREAL LEAF BEETLE (Oulema melanopus)in additional counties and townships in OHIO required extension of the regulated area; one extension was made in June and another in July. The regulated area includes 51 counties which are regulated in whole or in part. This pest does not appear to be present in large enough numbers to cause economic damage to grains in Ohio. The number of new counties and townships infested in MICHIGAN was considerably fewer than in 1964. However, the infested townships are so scattered that all of southeastern Michigan and the "thumb" area are included in the quarantine of July. Muskegon, Newaygo, Mecosta, Isabella, Midland, Bay, Tuscola and Huron Counties and all counties south are quarantined as well as parts of Oceana, Lake, Osceola, Clare and Arenac Counties. In late April and early May, 249,000 acres were treated in 5 counties. A retreatment about 10 days later in areas where late-emerging beetles were plentiful brought the total acres treated to about 383,000. Cereal leaf beetle extended its range into 9 counties in INDIANA. However, only the New Carlisle area, St. Joseph County, and La Porte County are the sites where heavy populations were present. First adult activity was observed April 16 (approximately 2 weeks later than that of 1964). Peak hatch on wheat occurred May 21-23 and on oats June 7-10. Larvae averaged as high as 4 per stem on oats in New Carlisle in mid-June. Pupation reached 90 percent about May 25 and peak emergence occurred by July 16. By July 23, 75-80 percent of the summer adults went into aestivation; all activity ceased by August 6. This leaf beetle was collected in ILLINOIS for the first time on May 11 in Will County. It was later collected in Kankakee and Vermilion Counties. Aerial treatments were applied in all areas where adults were found; 2,375 acres were treated in Will County, 4,075 acres in Kankakee County and 4,096 acres in Vermilion County. A second treatment to 320 acres was made in Vermilion County and 320 acres in Kankakee County where larvae were found. Surveys were made in WISCONSIN for cereal leaf beetle with negative results.

GREAT BASIN WIREWORM (Ctenicera pruinina) caused more than the usual damage to fall-sown wheat in Sherman County, OREGON, and SUGAR-BEET WIREWORM (Limonius californicus) was more abundant than usual on wheat and corn in Umatilla County. WIREWORMS and SEED-CORN BEETLE (Agonoderus lecontei) were noted on barley in COLORADO. RICE WATER WEEVIL (Lissorhoptrus oryzophilus) developed resistance to insecticides used in ARKANSAS and thus may become a greater problem.

ENGLISH GRAIN APHID (Macrosiphum avenae) reached peak populations in April on small grains in Yuma, Maricopa and Pinal Counties of ARIZONA. Damage was severe in many areas and controls were required. M. avenae and Rhopalosiphum rufiabdominalis were reported on small grains in TEXAS. English grain aphid was of little importance throughout the year in ARKANSAS; it was present in wheat until early May and again in early November in OKLAHOMA but numbers were light in all areas. M. avenae was at noneconomic levels on small grains in KANSAS and was light in wheat in southern NEBRASKA. English grain aphid was noted on wheat and barley in COLORADO. In SOUTH DAKOTA, English grain aphid is usually considered as occurring on small grains only; it was taken from wheat in Clark and Day Counties at the end of June. In mid-July, an aphid tentatively identified as M. avenae, was found in relatively large numbers (2,000-2,500 per 100 sweeps) on alfalfa in Clark and Codington Counties. A heavy flight of M. avenae occurred at Brookings July 28-29. Numbers built up to 30-50 per head on wheat in some eastern NORTH DAKOTA areas during July. Populations were generally low on small grains in MINNESOTA. English grain aphid was detected by April 30 in WISCONSIN where it increased gradually until late May. Populations remained fairly steady until harvest. Red leaf, resulting from transmission by aphids, was very low or appeared too late to affect small grains. This aphid was not economically important in MISSOURI in 1965, but was heavy on barley and wheat on the Eastern Shore of MARYLAND during May.

GREENBUG (Schizaphis graminum) was mostly light in wheat fields of Curry, Roosevelt, Lea, De Baca and Quay Counties, NEW MEXICO, and was noted on barley in COLORADO. Widespread infestations occurred in small grains in northwest and north central TEXAS; however, populations were generally light to moderate. This pest continued to be light in ARKANSAS. Populations of this aphid remained light throughout OKLAHOMA until mid-March; during late March and April, numbers increased but heavy infestations were reached only in certain parts of the southwest. Damage in most areas was light in the spring. Fall activity began in late October. Unusually warm weather until mid-December permitted infestations to increase, especially in sandy areas along the Cimarron River in central Oklahoma where counts up to 120 per linear foot were noted. Greenbug was at noneconomic levels on small grains in KANSAS; low numbers were found in many eastern wheat fields in the fall. This aphid was of little importance in MISSOURI. Greenbug was detected by May 14 in WISCONSIN but populations remained very low. In MINNESOTA, greenbug populations were generally low on small grains and little or no barley yellow dwarf virus was associated with this aphid in 1965. This aphid was present on small grains in NORTH DAKOTA.

CORN LEAF APHID (Rhopalosiphum maidis) caused damage to barley and corn in San Diego, Butte and Fresno Counties, CALIFORNIA. Infestations on grain in NEVADA were heavy and they caused severe damage in southern and central counties. Corn leaf aphid heavily infested grain, causing stunting and yellowing, in Clark County in early March and heavy grain infestations required treatments in some central counties in late June and early July in Nevada. Heavy populations on small grains in ARIZONA during late spring caused considerable damage in Yuma, Maricopa, Pinal, Pima and Graham Counties. Corn leaf aphid was noted on wheat, oats and barley in Mesa, Montrose, Delta and Garfield Counties, COLORADO, and on barley statewide. Light to moderate infestations were found in barley fields of NEW MEXICO in the southern counties during spring and early summer. Several fields were treated at Deming, Luna County, and in northern Dona Ana County. Corn leaf aphid was reported on small grains in TEXAS. In OKLAHOMA, corn leaf aphid was present in light to moderate numbers in wheat during the spring; fall activity began in mid-October. Populations were generally low in MINNESOTA on small grains and present on grains in NORTH DAKOTA.

APPLE GRAIN APHID (Rhopalosiphon fitchii) was heavy on winter wheat and barley in WASHINGTON in Grant County during late October. This aphid was heavy on barley in local areas of Butte and Sacramento Counties, CALIFORNIA. APHIDS in general were pests of cereal and forage crops in that State and they persisted longer into the year than normal. Apple grain aphid was noted on wheat and barley in COLORADO; in Mesa, Montrose, Delta and Garfield Counties it was noted on wheat, oats and barley. WESTERN WHEAT APHID (Brachycolus tritici) was present on barley in the Great Falls area of MONTANA. R. fitchii was present on small grains in NORTH DAKOTA. There were a few fields in west central and northwest MINNESOTA that had relatively high numbers of aphids present just before grain harvest. Damage, although apparent, occurred too late in the season. R. fitchii migrated to grains in May in WISCONSIN. Apple grain aphid was at noneconomic levels on small grains in KANSAS, but another aphid, R. subterraneum, was present in many wheat fields during the fall in both eastern and western sections; populations were very low, however. In OKLAHOMA, Rhopalosiphum padi occurred in light numbers until mid-March; heavy populations developed in wheat in the southwest through late March and in southwest, central and south central areas until mid-April. The first fall activity was noted in late October with light to moderate infestations occurring the remainder of 1965. Both R. fitchii and R. rufiabdominalis were reported on small grains in TEXAS.

SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) was first found on small grains in MICHIGAN on May 19 in Monroe, Lenawee, Washtenaw and Ingham Counties. This leafhopper was present very early in the season in MINNESOTA and by May 4 populations were higher than normal. A very low percent of the migrating leafhoppers carried aster yellows virus when they entered the State. Little damage was noted in Minnesota. Numbers ranged from a trace to 2-3 per sweep on small grains in NORTH DAKOTA during most of the season.

CHINCH BUG (Blissus leucopterus) was abundant in some wheat fields in OHIO during July in Logan and Delaware Counties; numerous instances of migration from small grains were reported. Heavy infestations in corn and wheat (mostly corn) occurred in eastern and western INDIANA. A FALSE CHINCH BUG (Nysius sp.) was noted on barley in western and southwestern areas of COLORADO. Light numbers of TARNISHED PLANT BUG (Lygus lineolaris) were noted on wheat in OKLAHOMA during November.

HESSIAN FLY (Mayetiola destructor) damaged a few fields in MICHIGAN; one report of injury to Monon wheat was noted in Berrien County in late June. Field populations of Hessian fly Race B capable of infesting Monon, Redcoat and Reed wheats have increased in size impact over those of 1964 in INDIANA. Samples from 381 certified wheat fields showed 82 percent of the Monon, 92 percent of the Reed and 83 percent of the Redcoat fields infested. Knox 62 wheat, a cultivar resistant to Race B, had only 12 percent of the fields infested. Although the number of Hessian fly infested resistant wheat fields increased over that of 1964, the average infestation for resistant cultivars remained low in Indiana. An annual survey in ILLINOIS showed that 1.28 percent of tillers were infested with 1.5 puparia per 100 plants; this was the lowest population since 1954 in the State. Losses to small grains by Hessian fly were noted in very few fields in MISSOURI; surveys of fall plantings indicated very light infestations. Populations were very low in the fall of 1965 in KANSAS and are expected to remain noneconomic in 1966. Four to five percent of the wheat plants locally in Steele County, NORTH DAKOTA, were found infested in late August. Only a few reports concerning damage were noted in WYOMING; damage to wheat was less than that of 1964. This pest was not so widespread as in 1964 in MONTANA when it appeared in 18 counties, but it was responsible for lower yields of wheat in many areas of the lower tier of counties from Big Horn east to the Dakotas. Spotted infestations occurred throughout the eastern fifth of the State. Hessian fly was found in late September in OREGON infesting volunteer wheat in a field of barley in Linn County.

WHEAT MIDGE (Sitodiplosis mosellana) was a problem in some late seedings of wheat in Roseau County, MINNESOTA. A large adult population of a CECIDOMYIID FLY (Anarete johnsoni) was observed in oat fields in Medina County, TEXAS, but no damage was noted. A RICE LEAF MINER (Hydrellia griseola) infested most rice-growing areas of CALIFORNIA but not in heavy numbers.

WHEAT STEM MAGGOT (Meromyza americana) reduced some grain yields in MONTANA. It caused only light damage in NEBRASKA wheat fields; damage was 2 percent in some fields in southwest area. Damage could be assessed at the end of June and beginning of July in SOUTH DAKOTA. A field of wheat near Gann Valley, Buffalo County, had 7 percent of the heads damaged; fields in Brule and Charles Mix Counties showed losses of 2 percent of the heads. There was a 3 percent loss in winter wheat in Clay County fields; losses ranged 1-3 percent in rye in Faulk, McPherson and Clark Counties, South Dakota. Wheat stem maggot, and at times STALK BORER (Papaipema nebris), caused whiteheads in grain fields throughout MINNESOTA. Populations of M. americana in small grains were down from those of 1964 although numerous adults were observed in early spring. FIELD CRICKETS (Gryllus spp.) created some problems in MONTANA, with some grain loss attributed to these insects.

BROWN WHEAT MITE (Petrobia latens) reduced grain yields in MONTANA. This mite was first noted in wheat fields of Platte, Goshen and Laramie Counties, WYOMING, in mid-May. Numbers in 1965 were much lower than those found in 1964, ranging 10-25 per linear foot of row. A SPIDER MITE (Tetranychus sp.) was noted in barley in COLORADO. Light populations of P. latens were present in wheat in northwest NEBRASKA. Activity of P. latens began in mid-March in OKLAHOMA and heavy infestations were soon present in the southwest area and in Ellis County. Heavy rains reduced the populations in many areas in mid-April but numbers remained present in isolated areas until mid-May. Populations of this spider mite were noted in the TEXAS Panhandle and some central areas but it was much lighter than in 1964. Other SPIDER MITES caused heavy damage to wheat in Denton and Floyd Counties of Texas. Scattered, spotted infestations of P. latens damaged small grains and alfalfa in NEW MEXICO during the spring in Dona Ana, Sierra, Lea, Eddy, Roosevelt and Curry Counties.

WINTER GRAIN MITE (Penthaleus major) was present in wheat from early January to early April in OKLAHOMA and again from mid-November through December. Numbers ranged up to 100 per linear foot in Major County in early December but most counts were light. This eupodid mite caused considerable damage to small grains in local areas in the north central part of TEXAS; infestations were generally widespread but light.

WHEAT CURL MITE (Aceria tulipae) was found for the first time in the State of OHIO in Wood county. This vector of wheat streak mosaic viruses was present in small numbers in KANSAS and a severe, local infection of the virus was found adjacent to established volunteer fields in the north central district. A potential buildup exists in this instance.

WHEAT STEM SAWFLY (Cephus cinctus) damage became apparent in numerous areas in OHIO in July with damage to wheat reported from 14 counties in the western section. Although 30 percent of the wheat stems were cut in a few fields, damage was light because the stems remained standing. Populations of this stem sawfly were down considerably in NORTH DAKOTA during 1965 and parasitism was very evident.

Other pests of small grains included a DESERT TERMITE (Amitermes sp.) in TEXAS, where damage to oats occurred in Madison County, and a TADPOLE SHRIMP (Triops longicaudatus) in CALIFORNIA where infestations occurred in rice plantings in Butte, Glenn and Sacramento Counties.

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